

CLAIMS

1. A pneumatic suspension system (1, 1') consisting of at least the following pneumatic suspension system components:

- A pneumatic suspension bellows (2, 2') made of elastomer material, said bellow having an contouring and enclosing an air chamber (10, 10') with a variable volume, whereby the pneumatic suspension bellows is provided with an embedded strength carrier in most cases, in particular in the form of axially extending thread reinforcements;
- a pneumatic suspension cover (3, 3') comprising a first fastening zone (4, 4') with an outside diameter (4, 4'), on which the one end of the pneumatic suspension bellows (2, 2') is secured by means of a clamping ring (5, 5') or the like;
- a pneumatic suspension piston (6, 6') comprising a second fastening zone (7, 7') with an outside diameter (D2) on which the other end of the pneumatic suspension bellows (2, 2') is secured by means of a clamping ring (8, 8') as well; as well as a roll-off piston (9, 9') with an outside diameter (D3), on whose outer wall the pneumatic suspension

bellows can roll off in conjunction with the formation of a rolling fold (13, 13');

- an outer guide (11, 11') for the pneumatic suspension bellows (2, 2'); as well as
- a static zone (A) of the pneumatic suspension bellows (2, 2') extending starting from the first fastening zone (4, 4') up to the outer guide (11, 11'), in conjunction with an increase in the outside diameter (D) of the pneumatic suspension bellows in most cases;

characterized in that

- the contoured pneumatic suspension bellows (2, 2') comprises a dynamic zone (B) subjected within the area of the rolling fold (13, 13') to a change in the diameter (D4) of the pneumatic suspension bellows as it is being loaded and relieved, such change occurring with respect to the outside diameter (D3) of the roll-off piston (9, 9').

2. The pneumatic suspension system according to claim 1, characterized in that in the unfolded position in the pressureless state, the dynamic zone (B) of the pneumatic

suspension bellows (2, 2') extends at least partially in a conical form.

3. The pneumatic suspension system according to claim 2, characterized in that the dynamic zone (B) of the pneumatic suspension bellows extends substantially exclusively in a conical form.

4. The pneumatic suspension system according to claim 2, characterized in that the dynamic zone (B) of the pneumatic suspension bellows (2') has a first conical section (B1), said section then changing in a cylindrical center section (B2), and from there then changing again in a second conical section (B3), the latter ending in the second fastening zone (7').

5. The pneumatic suspension system according to claim 4, characterized in that the first conical section (B1) has a greater expanse than the cylindrical center section (B2).

a 6. The pneumatic suspension system according to claim 4 or 5, characterized in that the cylindrical center section (B2) has a greater expanse than the second conical section (B3).

a 7. The pneumatic suspension system according to ^{claim 1} ~~any~~ one of claims 1 to 6, characterized in that within the

dynamic zone (B), the following parameters are applicable to the outside diameter (D) of the pneumatic suspension bellows (2, 2') in the condition of the unfolded position in the pressureless state, namely based on the outside diameter (D3) of the roll-off piston (9, 9'):

D (maximum) = 1.2 times D3

D (minimum) = D3.

8. The pneumatic suspension system according to ^{claim 1} ~~any one of claims 1 to 8~~, characterized in that within the dynamic range (B), the following parameters are applicable to the outside diameter (D) of the pneumatic suspension bellows (2, 2') in the condition of the unfolded position in the pressureless state, namely based on the outside diameter (D3) of the roll-off piston (9, 9')

D (maximum) = 1.15 times D3

D (minimum) = 1.05 times D3.

9. The pneumatic suspension system according to ^{claim 1} ~~any one of claims 1 to 8~~, in particular in association with claim 3, characterized in that the static zone (A) of the pneumatic suspension bellows (2) changes in the dynamic zone (B) of the pneumatic suspension bellows without a cylindrical intermediate section.

10. The pneumatic suspension system according to ^{claim 1} ~~any one of claims 1 to 8, in particular in association with any~~

~~one of claims 4 to 6~~, characterized in that the static zone (A) of the pneumatic suspension bellows (2') changes into a cylindrical intermediate section (A2), the latter being static as well, whereby said intermediate section (A2) is adjoined by the dynamic section (B) of the pneumatic suspension bellows.

a
a
11. The pneumatic suspension system according to ^{claim 1} ~~any~~ ~~one of claims 1 to 10~~, characterized in that the static zone (A, A1) of the pneumatic suspension bellows (2, 2') extends substantially exclusively in a conical form between the first fastening zone (4, 4') and the outer guide (11, 11').

a
12. The pneumatic suspension system according to ^{claim 1} ~~any~~ ~~one of claims 1 to 11~~, characterized in that in the relieved state, the outer guide (11, 11') substantially enclosed the entire dynamic zone (B) of the pneumatic suspension bellows (2, 2').

a
a
13. The pneumatic suspension system according to ^{claim 1} ~~any~~ ~~one of claims 1 to 12~~, characterized in that the following parameters are applicable to the outside diameter (D1) of the first fastening zone (4, 4') and to the outside diameter (D2) of the second fastening zone (7, 7'):
 $D1 \geq D2$.

add
B2
cont add
C1